



**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY**  
CARIBBEAN ENVIRONMENTAL PROTECTION DIVISION  
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**CERTIFIED MAIL /RETURN RECEIPT REQUESTED**  
**Article Number: 7015 0920 0000 8688 5252**

MAY 31 2017

Mr. Alvin E. Crespo  
Director  
Environmental Health and Safety  
Bristol-Myers Squibb Manufacturing Company  
Humacao Operations  
P.O. Box 609  
Humacao, Puerto Rico, 00792-1255

Re: Technical Review of the January 13, 2017 Release Assessment Investigation Treatability Testing Work Plan for the Bristol-Myers Squibb Manufacturing Company, Humacao, Puerto Rico  
EPA ID Number: PRD 090021056

Dear Mr. Crespo:

The United States Environmental Protection Agency-Region 2 (EPA) has reviewed the January 13, 2017 Release Assessment Investigation Treatability Testing Work Plan, submitted by Bristol-Myers Squibb Manufacturing Company (BMSMC) for its facility in Humacao, Puerto Rico. Enclosed are the EPA's comments on the Report. Please provide your response to the enclosed comments within 30 days of receipt of this letter. If you have any questions regarding this correspondence, please contact Socorro Martinez of my staff at (787) 977-5886 or via email at [martinez.socorro@epa.gov](mailto:martinez.socorro@epa.gov).

Sincerely,

Carmen R. Guerrero-Pérez  
Director

Caribbean Environmental Protection Division

cc: Manuel O. Claudio Rodriguez, Manager,  
Land Pollution Control Program, PREQ

Enclosure

## **TECHNICAL REVIEW**

**JANUARY 13, 2017**

### **RELEASE ASSESSMENT INVESTIGATION TREATABILITY TESTING WORK PLAN**

#### **BRISTOL-MYERS SQUIBB MANUFACTURING COMPANY**

#### **HUMACAO, PUERTO RICO**

## **I. GENERAL COMMENTS**

1. Previously implemented phases of the Release Assessment investigation activities identified the present of benzene, methyl tert-butyl ether (MTBE), Tert-amyl alcohol, 1,4-dioxane, naphthalene, C9-C10 aromatics, and C11-C22 aromatics at concentrations greater than screening levels along and immediately downgradient of the BSMC facility perimeter. However, this Release Assessment Investigation TTWP only identifies two primary drivers, 1,4-dioxane and C11-C22 aromatics, to be addressed and does not provide rationale for excluding the other COPCs from a rapid interim corrective measures (ICM) response. BSMC should clarify the overarching remedial strategy in the Release Assessment Investigation TTWP; specifically, BSMC should identify what COPCs will be addressed in a rapid ICM response versus long-term corrective measure(s) and outline the criteria utilized for making those decisions.

## **II. SPECIFIC COMMENTS**

### **Section 1 Introduction, Page 1-2**

2. The text indicates that the primary off-site contaminants of potential concern (COPCs) are 1,4-dioxane and C11-C22 aromatics. However, Figure 8 provided in Appendix A shows benzene, naphthalene, benzo(a)anthracene above the U.S. EPA tap water regional screening level (RSL). Since these COPCs are petroleum constituents and C11-C22 aromatics is a primary off-site COPC, please provide the rationale for not addressing benzene, naphthalene, benzo(a)anthracene.
3. Footnote #2 indicates that there were additional parameters identified in Table 7 of the November 21, 2016 Technical Memorandum Proposed Sampling program Offsite Groundwater, but that they are generally isolated and infrequently detected at low levels. If these parameters are above the screening levels and/or are considered petroleum constituents (i.e., associated with C11-C22 carbon range), then generally isolated and infrequently detected at low levels are not sufficient rationale for excluding. Clarify what constituents and at the concentrations of these parameters.

### **Section 2.3 Hydrogeological Setting, Pages 2-2 through 2-4**

4. The hydrogeological setting refers to activities conducted prior to the Release Assessment without a citation to the relevant document(s) to find the original source of information. For example, the text indicates that bedrock was encountered at a depth of 260 feet below ground surface (bgs) in deep boring monitoring well (MW-29), but a reference to the report that contains boring log for this

monitoring well installation was not included. Please update this section and provide the relevant references.

#### **Section 4.1 Site Preparation Activities**

5. Although BMSMC has established that there are currently no drinking water or potable water wells off-site, BMSMC has not indicated what interim institutional controls will be implemented to mitigate the installation of off-site wells while the groundwater is being treated and remains above U.S. EPA tapwater RSLs and/or (PREQB) Groundwater Standards.

#### **Section 4.2.1 General Drilling Procedures, Page 4-3**

6. BMSMC proposes adjusting boring/well locations in the field to accommodate possible underground/overhead utilities or other site conditions. To ensure that off-set boring/well locations still meet the project-specific data quality objectives (DQOs), BMSMC should utilize a systematic approach for off-setting boring/well locations and developing decision matrix or lines of communications for the field crew.

#### **Section 4.2.2 Collection and Analysis of Soil Samples, Page 4-3 and Appendix B - Quality Assurance Project Plan (QAPP) Section 4.2.1, Page 53**

7. The text indicates that if visual observations of non-aqueous phase liquid (NAPL) or photoionization detector (PID) readings greater than 20 part per million (ppm) above background are noted, the presence/absence of NAPL will be evaluate using hydrophobic dye. Please revise the text to indicate which hydrophobic dye will be used and at what detection level the hydrophobic dye will indicate a positive result.

#### **Section 4.2.3 Well Installation, Page 4-4**

8. The text indicates that pumping and injection well screens will coincide with the top of the observed confining layer and that the specific screen lengths and depths will be selected based on the subsurface conditions observed during the split-spoon sampling. The Release Assessment Investigation TTWP should include a decision matrix for the field crew regarding the appropriate selection of the screen lengths and depths based on what is observed in the field.

#### **Table 1 – Remedial Technology Screening Evaluation**

9. This table address 1,2-dioxane only and does not mention the other primary driver, C11-C22 aromatics (also see General Comment #1). The remedial technology screening evaluation table should be updated and include all of the COPCs that will be addressed in a rapid ICM response.
10. Please add a column in this table which indicates whether a remedial technology is retained for further consideration or not.

#### **Table 2 – Pumping Test and Injection Test Sampling Program and Table 4 – Bench-Scale Phase 2 Test Setup**

11. Section 4.7.2 Phase 2 – Contaminant Destruction Testing indicates that additional testing will be performed to evaluate the potential for mobilization of metals. However, Tables 2 and 4 appear to

indicate that metals will only be collected and analyzed during the baseline sampling event. To evaluate the mobilization of metals, samples will need to be collected and analyzed for metals during the Phase 2 Reactors (post-testing). Please revise Tables 2 and 4 accordingly.

**Figure 3 – Conceptual Tracer Study Well Network and Figure 4 – Conceptual Pumping Test Well Network**

12. Figures 3 and 4 shows the tracer study well network or pumping test well network without a facility map or any landmarks in the background to provide context for the projected radius of influence (ROI). Revise these figures to include a to-scale facility map in the background.

**Appendix B – QAPP, QAPP Worksheet #12: Measurement Performance Criteria and QAPP Worksheet #28: Analytical Quality Control and Corrective Action**

13. Where the Data Quality Indicator (DQI) for accuracy varies by analyte (e.g., surrogate recoveries), please indicate if laboratory measurement performance criteria (i.e., in-house quality control limits) or if project-specific measurement performance criteria will be utilized. Also, note that the analyte-specific measurement performance criteria should be provided in a table in this QAPP.

**Appendix B – QAPP, QAPP Worksheet #15-1: Laboratory Limits for Soil and QAPP Worksheet #15-2: Laboratory Limits for Groundwater**

14. Several COPCs have project action limits below the reporting limits (e.g., C9-C10 aromatics, C11-C22 aromatics, benzene, 1,4-dioxane, tert-amyl alcohol, and naphthalene). Please indicate how BSMSC is proposing to address this issue and what secondary line(s) of evidence will be used to indicate whether these COPC concentrations are above/below the project action limits.

**Appendix B – QAPP, QAPP Worksheet #22: Field Equipment Calibration, Maintenance, Testing, and Inspection**

15. The table in Section 4.2.2.2 Pump Test and Injection/Tracer Test Sampling indicates that groundwater samples will be collected with a bladder pump, but QAPP Worksheet #22 indicates that a Grundfos Redi-Flo4 submersible pump will be utilized. Please reconcile and update the table in Section 4.2.2.2 or QAPP Worksheet #22 accordingly.

**Appendix B – QAPP, QAPP Worksheet #36: Data Validation Procedures**

16. QAPP Worksheet #36 indicates that a Level 2 data package will be requested. A Level 2 data package will report the sample results only and none of the quality assurance/quality control (QA/QC) sample results will be included. Thus, it would not be possible to evaluate the DQIs and corresponding measurement performance criteria in QAPP Worksheets #12 and #28 with a Level 2 data package. To meet the data quality objectives outlined in this QAPP, a Level 3 or Level 4 data package should be requested instead.
17. QAPP Worksheet #36 also indicate that none of the data packages will be validated. Since this data is going to be used to evaluate remedial technologies selected for a rapid ICM response, the data must be of sufficient quality to make this decision. Thus, it is strongly recommended that the data be validated (at least data validation of Level 3 data packages) to ensure that all the data is usable for its intended purpose.